## CLAIMS

1. A method of automatically inspecting matter for varying composition, comprising advancing a stream of said matter through a detection station (131), emitting a detection medium to be active at a transverse section of said stream at said detection station (131), wherein said medium is varied by variations in the composition of said matter at said transverse section, detecting the varied medium at detecting means (14,114) and generating detection data in dependence upon the variations in said medium, characterised by receiving the varied medium over substantially the width of the stream at receiving means (7; 107) which physically extends across substantially the width of said stream and which transmits the varied medium towards said detecting means (14,114), and also characterized in that the varied medium converges upon itself during its travel from said receiving means (7;107) to said detecting means (14,114).

2. A method according to claim 1, wherein said emitting occurs at a location significantly spaced from said receiving means (7; 107).

3. A method according to claim 1 or 2, wherein said emitting occurs over substantially the width of said stream.

4. A method according to any preceding claim, wherein said transverse section comprises a multiplicity of individual detection zones distributed across substantially the width of said stream.

5. A method according to claim 4, wherein the detection data from said individual detection zones is used to construct a two-dimensional simulation of said matter passing through said detection station.

6. A method according to claim 5, wherein said two-dimensional simulation is analyzed using image processing.

7. A method according to any preceding claim, wherein said detection medium comprises electromagnetic radiation which irradiates said section, said generating including determining the intensity of electromagnetic radiation of selected wavelength(s) reflected from portions (125) of said stream distributed across said stream.

8. A method according to claim 7, wherein said portions

(125) comprise polymer and said selected wavelengths comprise a plurality of wavelength bands in the region 1.5 microns to 1.85 microns.

9. A method according to claim 7 or 8, wherein said receiving means (7; 107) receives from said stream diffusely reflected said electromagnetic radiation travelling substantially perpendicularly to a widthwise and lengthwise plane of said stream.

10. A method according to claim 7, 8, or 9, as appended to claim 4, wherein said determining is performed for each detection zone in respect of a plurality of wavelengths simultaneously.

11. A method according to claim 7, 8, or 9, as appended to claim 4, wherein said electromagnet radiation is supplied as pulses to each detection zone in a frequency multiplexed manner.

12. A method according to claim 7, 8, or 9, as appended to claim 4, wherein said determining is performed for each detection zone in respect of a plurality of said wavelengths in a time multiplexed manner.

13. A method according to any one of claims 7 to 12, wherein portions of said stream are substantially transparent to said electromagnetic radiation and said stream is advanced on a supporting surface (4, 104) which is diffusely reflective of said electromagnetic radiation.

14. A method according to any one of claims 7 to 12, wherein said matter comprises laminate (125, 186) comprised of a first layer (184) and a second layer (180) underneath said first layer (184) and of a material having a spectrum of reflected said electromagnetic radiation significantly different from that of the material of the first layer (184).

15. A method according to claim 14, wherein said stream of matter is a continuous strip of laminate (186) advancing on a laminating machine and said detection data is utilised to control the laminating process performed on said machine.

16. A method according to claim 15, wherein said first layer (184) is a coating of a polymer and said second layer (180) is a substrate (180) and variation in the composition of said first layer (184) is detected at said detecting

means (114) and said detection data is utilised to control the coating process in said machine.

17. A method according to claim 16, wherein said variation in composition is variation in thickness of said first layer.

18. A method according to any one of claims 1 to 14, and further comprising utilising said detection data to separate from said stream a stream fraction comprised of desired portions (125) of said stream.

19. A method according to claim 18, wherein said stream comprises solid food.

20. A method according to claim 19, wherein said solid food comprises higher-quality discrete portions and lower-quality discrete portions and said detection data is utilised to separate the stream into a higher-quality fraction and a lower-quality fraction, one of which fractions is comprised of said desired portions (125).

21. A method according to claim 18 as appended to claim 14, wherein said stream fraction comprises said laminate (125) as said desired portions (125).

22. A method according to claim 21, wherein said stream of matter is a stream of waste including said laminate (125) in the form of polymer-coated paperboard objects (125) and said determining is solely as to whether a portion of said waste is or is not a polymer-coated paperboard object (125), said stream fraction being comprised of the polymer-coated paperboard objects (125) as said desired portions (125).

23. A method according to claim 22, wherein said polymer is polyethylene, said substrate is paperboard and one of said wavelengths is in a band centred on substantially 1.7 microns.

24. A method according to claim 18, 21, 22, or 23, as appended to claim 7, and further comprising separating from said stream by means of eddy current ejection a second fraction comprised of metal portions.

25. A method according to any one of claims 21 to 23, and further comprising advancing said stream through a metal-detection station (131) including a multiplicity of metal-detection zones distributed across said stream, inducing eddy currents in metal portions of said stream at said

metal-detection station, producing electrical signals in dependence on said eddy currents, and utilizing said detection data in the form of said electrical signals in separating from said stream a stream fraction comprised of said metal portions as other desired portions.

26. A method according to any one of claims 21 to 25, and further comprising simultaneously cycling through the method, including advancing through the detection station(s) (131) another stream of matter, and utilizing the detection data obtained from said other stream in separating therefrom another fraction comprised of further desired portions.

27. A method according to claim 26, wherein the first-mentioned stream and said other stream are advanced in a common direction through said detection station.

28. A method according to claim 26, wherein the first-mentioned stream and said other stream are advanced in respective opposite directions through said detection station.

29. A method according to any one of claims 18 to 28, wherein the separating comprises causing air jet pulses to impinge upon said desired portions to force the same out of the stream(s).

30. A method according to claim 29, wherein said advancing is relatively fast and said air jet pulses are relatively weak.

31. A method according to any one of claims 26 to 28, or claim 28 or 29 as appended to claim 25, wherein said other stream comprises the separated-out fraction(s) of the first-mentioned stream.

32. A method according to any one of claims 26 to 28, or claim 29 or 30 as appended to claim 26, wherein said other fraction consists predominantly of a material of a differing constituency from that of the separated-out fraction(s) of the first-mentioned stream.

33. Apparatus for automatically inspecting matter for varying composition, comprising advancing means (4; 104; 185) for advancing a stream of said matter, a detection station (131) through which said advancing means (4; 104; 185) advances said stream, emitting means (5; 105) serving to emit a detection medium to be active at a transverse

section of said stream at said station (131), detecting means (14;114) serving to generate detection data in dependence upon the variations in said medium, and data-obtaining means (15; 135) connected to said detecting means (14; 114) and serving to obtain said detection data therefrom, characterised by receiving means (7; 107) at said station (131) arranged to extend physically across substantially the width of said stream and serving to receive detection medium varied by variations in the composition of said matter at said section, and to transmit the varied medium to said detecting means (14,114) such that the varied medium converges upon itself during its travel from said receiving means (7,107) to said detecting means (14,114).

34. Apparatus according to claim 33, wherein said emitting means (5; 105) is significantly spaced from said receiving means (7; 107).

35. Apparatus according to claim 33 or 34, wherein said emitting means (5; 105) is arranged to extend physically across substantially the width of said stream.

36. Apparatus according to claim 33, 34, or 35, wherein said emitting means (5; 105) serves to emit electromagnetic radiation as said detection medium, said detecting means (14; 114) serving to determine the intensity of electromagnetic radiation of selected wavelength(s) reflected from portions (125) of said stream distributed across said stream.

37. Apparatus according to claim 36, wherein said emitting means (105) is arranged to irradiate said portions (125) obliquely relative to a widthwise and lengthwise plane of said stream and said receiving means (107) is arranged to receive from said portions (125) diffusely reflected said electromagnetic radiation travelling substantially perpendicularly to that plane.

38. Apparatus according to claim 36 or 37, wherein said emitting means (5;105) comprises a multiplicity of sources (5;105) of said electromagnetic radiation arranged to be distributed across said stream.

39. Apparatus according to any one of claims 36 to 38, wherein said advancing means (4, 104) has a stream-

supporting surface which is diffusely reflective of said electromagnetic radiation.

40. Apparatus according to any one of claims 36 to 39 and included in a laminating machine, said data-obtaining means (135) serving to control the laminating process performed on said machine.

41. Apparatus according to any one of claims 36 to 39 and further comprising, downstream of said detection station (131), separating means (116) serving to separate from said stream a fraction comprised of desired portions (125) of said stream selected in accordance with said detection data obtained.

42. Apparatus according to claim 41, and further comprising an eddy current ejection arrangement (170) serving to eject metal portions from said stream.

43. Apparatus according to claim 42, wherein said separating means (116) and said eddy current ejection arrangement (170) are disposed one immediately after the other along said advancing means (104).

44. Apparatus according to any one of claims 36 to 43, wherein said receiving means (7; 107) comprises reflecting means (7; 107).

45. Apparatus according to claim 44, wherein said reflecting means (107) comprises a mirror (107) which is substantially arcuate concavely in a plane parallel to the widthwise and lengthwise plane of said stream and which is obliquely inclined to the former plane.

46. Apparatus according to claim 45, wherein said mirror (107) is part of an imaginary, substantially toroidal surface.

47. Apparatus according to claim 44, wherein said reflecting means (107) comprises a multiplicity of reflectors (107a) distributed in a row arranged to extend substantially rectilinearly across said stream, said reflectors (107a) being differingly orientated so as to transmit electromagnetic radiation reflected from a multiplicity of detection zones distributed across said stream at said transverse section.

48. Apparatus according to any one of claims 36 to 47, and further comprising a polygonal mirror (108) interposed

between said receiving means (107) and said detecting means (114) and having its reflective faces arranged around an axis of rotation of said polygonal mirror (108).

49. Apparatus according to any one of claims 36 to 43, wherein said receiving means (7) comprises conducting means (7) for conducting therealong said electromagnetic radiation.

50. Apparatus according to claim 49, wherein said conducting means (7) comprises a multiplicity of optical fibres (7) having their entrances arranged to be distributed across said stream.

51. Apparatus according to any one of claims 36 to 50, and further comprising beam splitting means (122) interposed between said receiving means (107) and said detecting means (114) for said electromagnetic radiation.

52. Apparatus according to any one of claims 36 to 51, and further comprising a metal-detection station (131) past which said advancing means (104) advances said stream, another emitting means (138) serving to generate an electromagnetic field, and another receiving means (139) arranged so as to be discretely distributed across said stream at said metal-detection station (131) and serving to detect metal portions of said stream advancing past said metal-detection station (131), and metal-separating means(116) downstream of said metal-detecting means (139) and serving to separate from said stream a fraction comprised of said metal portions.

53. Apparatus according to claim 52, wherein said emitting means (138) which serves to generate an electromagnetic field comprises an antenna (138) extending across said advancing means (104) at said metal-detection station (131), said advancing means (104) being situated between said antenna (138) and said receiving means (139) for the field.

54. Apparatus according to claim 41, 42, or 43, or any one of claims 44 to 53 as appended to claim 41, wherein said advancing means (104) comprises a substantially planar conveying surface and said separating means (116) is carried by an auxiliary conveying means (127) positionable at said conveying surface to lift said stream from said conveying surface and forward said stream to said separating means

(116).

55. Apparatus according to any one of claims 33 to 54, and further comprising second advancing means (104) serving to advance another stream of matter through the detection station(s) (131), said receiving means (7;107) serving also to receive detection medium varied by variations in the composition of the matter of said other stream at a transverse section of said other stream, said detecting means (14,114) serving also to generate detection data in dependence upon the latter variations in said medium, said data-obtaining means (15,135) serving also to obtain said detection data in respect of said other stream.

56. Apparatus according to claim 55, wherein said second advancing means (104) is arranged to advance said other stream through the detection station(s) (131) in substantially the same direction as that in which the first-mentioned advancing means (104) is arranged to advance the first- mentioned stream through the detection station(s) (131).

57. Apparatus according to claim 56, wherein said first-mentioned advancing means (104) and said second advancing means (104) take the form of a single conveyor (104).

58. Apparatus according to claim 57, wherein said single conveyor (104) includes a single conveying belt (104).

59. Apparatus according to claim 57 or 58, wherein said single conveyor (104) has a portion (160) extending therealong to keep the streams apart from each other.

60. Apparatus according to claim 56, wherein said second advancing means (104B) is arranged to advance said other stream through the detection station(s) (131) in substantially the opposite direction to that in which the first-mentioned advancing means (104A) is arranged to advance the first-mentioned stream through the detection station(s) (131).

61. Apparatus according to any one of claims 55 to 60 as appended to claim 41, and further comprising returning means (164) serving to transport the separated-out fraction(s) of the first-mentioned stream to said second advancing means (104B) upstream of said detection station(s) (131) to constitute said other stream.

62. Apparatus according to any one of claims 55 to 61, wherein said separating means (116) serves also to separate another fraction from said other stream.

63. Apparatus according to claim 41, 42, 43, 52, or 62, wherein the separating means (116) comprises one or more rows of air jet nozzles (116) arranged transversely of the advancing means (104).

64. A method of automatically inspecting matter for varying composition, comprising advancing a stream of said matter through a detection station (131), irradiating with electromagnetic radiation comprising substantially invisible electromagnetic radiation a section of said stream at said station (131), scanning said section and determining the intensity of substantially invisible electromagnetic radiation of selected wavelength(s) reflected from portions of said stream, and obtaining detection data from said detection station (131), characterised in that said scanning is performed in respect of a plurality of discrete detection zones distributed across said stream and in that said determining is performed for each detection zone in respect of a plurality of said wavelengths simultaneously.

65. A method according to claim 64, wherein portions of said stream comprise polymer and said plurality of wavelengths comprise a plurality of wavelength bands in the region 1.5 microns to 1.85 microns.

66. A method of separating polymer-coated paperboard objects from a stream of waste, comprising advancing said stream through a detection station (131) and separating the polymer-coated paperboard objects (125) from the stream, characterised in that at said station (131) a determination is made, using substantially invisible electromagnetic radiation, solely as to whether a portion of said waste is or is not a polymer-coated paperboard object (125).

67. A method of automatically inspecting matter for varying composition, comprising advancing through a detection station (131) a first stream of matter, emitting detection medium to be active at a transverse section of said stream at said detection station (131), wherein said medium is varied by variations in the composition of said matter at said transverse section, obtaining from said detection station

(131) first detection data as to a constituent of said first stream, characterised by advancing a second stream of matter through said detection station (131) simultaneously with said first stream, emitting detection medium to be active at a transverse section of said second stream at said detection station (131), wherein the latter medium is varied by variations in the composition of matter of said second stream at the latter transverse section, and obtaining from said detection station (131) second detection data as to a constituent of said second stream, and also characterised in that the varied medium from both of the first and second streams is received by a receiving device (7, 107) common to both streams.

68. A method according to claim 67, wherein each of the first and second streams comprises objects distributed across the stream.

69. A method according to claim 67 or 68, wherein the first and second streams are advanced in a common direction through said detection station (131).

70. A method according to claim 67 or 68, wherein the first and second streams are advanced in respective opposite directions through said detection station (131).

71. A method according to any one of claims 67 to 70, and further comprising utilising the first and second detection data to separate from the respective first and second streams respective first and second fractions comprised of said constituent of said first stream and said constituent of said second stream, respectively.

72. A method according to claim 71, wherein the first fraction constitutes the second stream.

73. A method according to any one of claims 67 to 72, wherein said constituent of said first stream is of substantially the same composition as said constituent of said second stream.

74. A method according to any one of claims 67 to 72, wherein said constituent of said first stream is of a significantly different composition from said constituent of said second stream.

75. Apparatus for automatically inspecting matter for varying composition, comprising a detection station (131),

first advancing means (104) serving to advance through said station (131) a first stream of matter, first emitting means (5;105;138) serving to emit detection medium to be active at a transverse section of said stream at said detection station, a receiving device (7;107;139) serving to receive detection medium varied by variations in the composition of said matter at said section, detecting means (4; 114; 140) serving to produce first detection data as to a constituent of said first stream at said station (131), characterised in that second advancing means (104) serves to advance a second stream of matter through said station (131) simultaneously with said first stream, and second emitting means (5;105;138) serves to emit detection medium to be active at a transverse section of said second stream at said detection station (131), in that said receiving device (7;107;139) serves also to receive detection medium varied by variations in the composition of the matter at the latter section and is thus common to both of the first and second advancing means (104), and in that said detecting means (4; 114; 140) serves to produce second detection data as to a constituent of said second stream.

76. Apparatus according to claim 75, wherein each of the first and second advancing means (104) serves to advance its stream as a stream comprised of objects distributed across the stream.

77. Apparatus according to claim 75 or 76, wherein the first and second advancing means (104) are arranged to advance the first and second streams through said detection station (131) in a common direction.

78. Apparatus according to claim 77, wherein the first and second advancing means (104) take the form of a single conveyor (104).

79. Apparatus according to claim 78, wherein said single conveyor (104) includes a single conveying belt (104).

80. Apparatus according to claim 78 or 79, wherein said single conveyor (104) has a partition (160) extending therealong to keep the streams apart from each other.

81. Apparatus according to claim 75 or 76, wherein the first and second advancing means (104A, 104B) are arranged to advance the first and second streams in respective

opposite directions through said detection station (131).

82. Apparatus according to any one of claims 75 to 80, and further comprising returning means (164) serving to transport to said second advancing means (104) upstream of said station (131) to constitute said second stream a separated-out fraction of said first stream comprised of said constituent of said first stream.

83. Apparatus according to any one of claims 75 to 82, wherein the first and second emitting means (5; 105;138) are so arranged as to extend across both of the first and second streams.

84. Apparatus according to claim 83, wherein the first and second emitting means (5;105) comprise a row of radiation sources (5;105).

85. Apparatus according to any one of claims 75 to 84, wherein said receiving device (7;107;139) is so arranged as to extend across both of the first and second streams.

86. Apparatus according to claim 85, wherein said receiving device (107) comprises a radiation-reflecting device (107).

87. Apparatus according to claim 86, wherein said reflecting device (107) comprises a mirror (107) which is substantially arcuate concavely in a plane parallel to a widthwise plane of the first and second streams and which is obliquely inclined to the former plane.

88. Apparatus according to claim 87, wherein said mirror (107) is part of an imaginary, substantially toroidal surface.

89. Apparatus according to any one of claims 75 to 83, wherein said receiving device (139) comprises a multiplicity of metal-sensing means (139) arranged so as to be discretely distributed across the first and second streams and serving to detect metal portions constituting the constituent(s) of at least one of the first and second streams.

90. Apparatus for automatically inspecting matter for varying composition, comprising advancing means (104) for advancing a stream of said matter, a detection station (131) through which said advancing means (104) advances said stream, emitting means (138) serving to emit a detection medium to be active at a transverse section of said stream

at said station (131), receiving means (139) at said station (131) arranged to extend physically across substantially the width of said stream serving to receive detection medium varied by variations in the composition of said matter at said section, detecting means (140) serving to generate detection data in dependence upon the variations in said medium, and data-obtaining means (135) connected to said detecting means (140) and serving to obtain said detection data therefrom, characterised in that said station (131) is a metal-detection station, said emitting means (138) serves to emit an electromagnetic field, and said receiving means (139) comprises a multiplicity of electromagnetic field sensing devices (139) arranged to be distributed across said stream.

91. Apparatus according to claim 90, wherein said emitting means (138) which serves to generate an electromagnetic field comprises an antenna (138) extending across said advancing means (104) at said metal-detection station (131).

92. Apparatus according to claim 90 or 91, wherein said advancing means (104) is situated between said emitting means (138) and said receiving means (139) for the field.

93. Apparatus according to any one of claims 90 to 92, wherein said emitting means (138) is connected to an oscillator (137), whereby said electromagnetic field oscillates, and wherein said sensing devices (139) are electromagnetic field frequency sensing devices (139).

94. Apparatus according to any one of claims 90 to 93, wherein said data-obtaining means (135) serves to construct from the detection data from said electromagnetic field sensing devices (139) a two-dimensional simulation of said matter passing through said detection station (131).

95. A method of automatically inspecting matter for varying composition, comprising advancing a stream of said matter through a detection station (131), emitting a detection medium to be active at a transverse section of said stream at said detection station (131), wherein said medium is varied by variations in the composition of said matter at said transverse section, receiving the varied medium over substantially the width of the stream at

receiving means (7; 107; 139) which physically extends across substantially the width of said stream, and generating detection data in dependence upon the variations in said medium, characterised in that said transverse section comprises a multiplicity of individual detection zones distributed across substantially the width of said stream, and the detection data from said individual detection zones is used to construct a two-dimensional simulation of said matter passing through said detection station.

96. A method according to claim 95, wherein said two-dimensional simulation is analyzed using image processing.

97. A method according to claim 95 or 96, and further comprising utilising said detection data to separate from said stream a stream fraction comprised of desired portions (125) of said stream.

98. A method according to any one of claims 95 to 97, wherein said detection medium comprises electromagnetic radiation which irradiates said section, said generating including determining the intensity of electromagnetic radiation of selected wavelength(s) reflected from portions (125) of said stream distributed across said stream.

99. A method according to any one of claims 95 to 97, wherein said detection medium comprises an electromagnetic field which induces eddy currents in metal portions of said stream at said detection station.

**What is claimed is:**

100. A method of automatically inspecting matter for varying composition, comprising advancing a stream of said matter through a detection station, emitting a detection medium to be active at a transverse section of said stream at said detection station, wherein said medium is varied by variations in the composition of said matter at said transverse section, receiving the varied medium over substantially the width of the stream at receiving means which physically extends across substantially the width of said stream, and generating detection data in dependence upon the variations in said medium, wherein said transverse section comprises a multiplicity of individual detection zones distributed across substantially the width of said stream, and the detection data from said individual detection zones is used to construct a two-dimensional simulation of said matter passing through said detection station.

101. A method according to claim 100, wherein said two-dimensional simulation is analyzed using image processing.

102. A method according to claim 100, wherein said detection medium comprises electromagnetic radiation which irradiates said section, said generating including determining the intensity of electromagnetic radiation of selected wavelength(s) reflected from portions of said stream distributed across said stream.

103. A method according to claim 102, wherein said portions comprise polymer and said selected wavelengths comprise a plurality of wavelength bands in the region 1.5 microns to 1.85 microns.

104. A method according to claim 102, wherein said receiving means receives from said stream diffusely reflected said electromagnetic radiation travelling substantially perpendicularly to a widthwise and lengthwise plane of said stream.

105. A method according to claim 102, wherein said determining is performed for each detection zone in respect of a plurality of wavelengths simultaneously.

106. A method according to claim 102, wherein portions of said stream are substantially transparent to

said electromagnetic radiation and said stream is advanced on a supporting surface which is diffusely reflective of said electromagnetic radiation.

107. A method according to claim 102, wherein said matter comprises laminate comprised of a first layer and a second layer underneath said first layer and of a material having a spectrum of reflected said electromagnetic radiation significantly different from that of the material of the first layer.

108. A method according to claim 107, wherein said stream of matter is a continuous strip of laminate advancing on a laminate-producing machine and said detection data is utilised to control the laminating process performed on said machine.

109. A method according to claim 108, wherein said first layer is a coating of a polymer and said second layer is a substrate and variation in the composition of said first layer is detected at said detecting means and said detection data is utilised to control the coating process in said machine.

110. A method according to claim 100, and further comprising utilising said detection data to separate from said stream a stream fraction comprised of desired portions of said stream.

111. A method according to claim 110, wherein said stream comprises solid food.

112. A method according to claim 110, wherein said matter comprises laminate comprised of a first layer and a second layer underneath said first layer and of a material having a spectrum of reflected said electromagnetic radiation significantly different from that of the material of the first layer, wherein said stream fraction comprises said laminate as said desired portions, and wherein said stream of matter is a stream of waste including said laminate in the form of polymer-coated paperboard objects and said determining is solely as to whether a portion of said waste is or is not a polymer-coated paperboard object, said stream fraction being comprised of the polymer-coated paperboard objects as said desired portions.

113. A method according to claim 100, wherein said

detection medium comprises an electromagnetic field which induces eddy currents in metal portions of said stream at said detection station.

114. A method according to claim 113, wherein said stream is advanced through a metal-detection station including a multiplicity of metal-detection zones distributed across said stream, said eddy currents being induced in said metal portions of said stream at said metal-detection station, electrical signals are produced in dependence on said eddy currents, and said detection data in the form of said electrical signals are utilized in separating from said stream a stream fraction comprised of said metal portions as desired portions.

115. A method according to claim 112 or 114, and further comprising simultaneously cycling through the method, including advancing through the detection station(s) another stream of matter, and utilizing the detection data obtained from said other stream in separating therefrom another fraction comprised of further desired portions.

116. A method according to claim 115, wherein the first- mentioned stream and said other stream are advanced in a common direction through said detection station.

117. A method according to claim 115, wherein the first- mentioned stream and said other stream are advanced in respective opposite directions through said detection station.

118. A method according to claim 110 or 114, wherein the separating comprises causing air jet pulses to impinge upon said desired portions to force the same out of the stream(s).

119. A method according to claim 118, wherein said advancing is relatively fast and said air jet pulses are relatively weak.

120. A method according to claim 115, wherein said other stream comprises the separated-out fraction(s) of the first-mentioned stream.

121. A method according to claim 115, wherein said other fraction consists predominantly of a material of a differing constituency from that of the separated-out fraction(s) of the first-mentioned stream.

122. A method according to claim 100, wherein said receiving means transmits the varied medium towards detecting means, and the varied medium converges upon itself during its travel from said receiving means to said detecting means.

123. A method according to claim 100, wherein said emitting occurs at a location significantly spaced from said receiving means.

124. A method according to claim 100, wherein said emitting occurs over substantially the width of said stream.

125. Apparatus for automatically inspecting matter for varying composition, comprising advancing means for advancing a stream of said matter, a detection station through which said advancing means advances said stream, emitting means serving to emit a detection medium to be active at a transverse section of said stream at said station, said transverse section being comprised of a multiplicity of individual detection zones distributed across substantially the width of said stream, receiving means at said station arranged to extend physically across substantially the width of said stream and serving to receive detection medium varied by variations in the composition of said matter at said section, detecting means serving to generate detection data in dependence upon the variations in said medium, and data-obtaining means connected to said detecting means and arranged to use the detection data from said individual detection zones to construct a two-dimensional simulation of said matter passing through said detection station.

126. Apparatus according to claim 125, wherein said emitting means serves to emit electromagnetic radiation as said detection medium, said detecting means serving to determine the intensity of electromagnetic radiation of selected wavelength(s) reflected from portions of said stream distributed across said stream.

127. Apparatus according to claim 126, wherein said emitting means is arranged to irradiate said portions obliquely relative to a widthwise and lengthwise plane of said stream and said receiving means is arranged to receive from said portions diffusely reflected said electromagnetic radiation travelling substantially perpendicularly to that

plane.

128. Apparatus according to claim 126 or 127, wherein said emitting means comprises a multiplicity of sources of said electromagnetic radiation arranged to be distributed across said stream.

129. Apparatus according to claim 126 and further comprising, downstream of said detection station, separating means serving to separate from said stream a fraction comprised of desired portions of said stream selected in accordance with said detection data obtained.

130. Apparatus according to claim 129, and further comprising an eddy current ejection arrangement serving to eject metal portions from said stream.

131. Apparatus according to claim 130, wherein said separating means and said eddy current ejection arrangement are disposed one immediately after the other along said advancing means.

132. Apparatus according to claim 126, wherein said receiving means comprises reflecting means.

133. Apparatus according to claim 132, wherein said reflecting means comprises a mirror which is substantially arcuate concavely in a plane parallel to the widthwise and lengthwise plane of said stream and which is obliquely inclined to the former plane.

134. Apparatus according to claim 133, wherein said mirror is part of an imaginary, substantially toroidal surface.

135. Apparatus according to claim 126, and further comprising a polygonal mirror interposed between said receiving means and said detecting means and having its reflective faces arranged around an axis of rotation of said polygonal mirror.

136. Apparatus according to claim 126, and further comprising a metal-detection station past which said advancing means advances said stream, another emitting means serving to generate an electromagnetic field, and another receiving means arranged so as to be discretely distributed across said stream at said metal-detection station and serving to detect metal portions of said stream advancing past said metal-detection

station, and metal-separating means downstream of said metal-detecting means and serving to separate from said stream a fraction comprised of said metal portions.

137. Apparatus according to claim 136, wherein said emitting means which serves to generate an electromagnetic field comprises an antenna extending across said advancing means at said metal-detection station, said advancing means being situated between said antenna and said receiving means for the field.

138. Apparatus according to claim 125, and further comprising second advancing means serving to advance another stream of matter through the detection station, said receiving means serving also to receive detection medium varied by variations in the composition of the matter of said other stream at a transverse section of said other stream, said detecting means serving also to generate detection data in dependence upon the latter variations in said medium, said data-obtaining means serving also to obtain said detection data in respect of said other stream.

139. Apparatus according to claim 138, wherein said second advancing means is arranged to advance said other stream through the detection station in substantially the same direction as that in which the first-mentioned advancing means is arranged to advance the first-mentioned stream through the detection station, and wherein said first-mentioned advancing means and said second advancing means take the form of a single conveyor.

140. Apparatus according to claim 139, wherein said single conveyor includes a single conveying belt.

141. Apparatus according to claim 138 and further comprising, downstream of said detection station, separating means serving to separate from said stream a fraction comprised of desired portions of said stream selected in accordance with said detection data obtained, and also comprising returning means serving to transport the separated-out fraction of the first-mentioned stream to said second advancing means upstream of said detection station to constitute said other stream.

142. Apparatus according to claim 138, wherein said

separating means serves also to separate another fraction from said other stream.

143. Apparatus according to claim 129 or 136, wherein the separating means comprises one or more rows of air jet nozzles arranged transversely of the advancing means.

Sub B11

144. A method of automatically inspecting matter for varying composition, comprising advancing a stream of said matter through a detection station, irradiating with electromagnetic radiation comprising substantially invisible electromagnetic radiation a section of said stream at said station, scanning said section and determining the intensity of substantially invisible electromagnetic radiation of selected a wavelength(s) received ~~reflected~~ from portions of said stream, and obtaining detection data from said detection station, wherein said scanning is performed in respect of a plurality of discrete detection zones distributed across said stream and said determining is performed for each detection zone in respect of a plurality of said wavelengths simultaneously.

145. A method according to claim 144, wherein portions of said stream comprise polymer and said plurality of wavelengths comprise a plurality of wavelength bands in the region 1.5 microns to 1.85 microns.

~~146. A method of separating polymer-coated paperboard~~ objects from a stream of waste, comprising advancing said stream through a detection station and separating the polymer-coated paperboard objects from the stream, wherein at said station a determination is made, using substantially invisible electromagnetic radiation, solely as to whether a portion of said waste is or is not a polymer-coated paperboard object.

147. A method of automatically inspecting matter for varying composition, comprising advancing through a detection station a first stream of matter, emitting detection medium to be active at a transverse section of said stream at said detection station, wherein said medium is varied by variations in the composition of said matter at said transverse section, obtaining from said detection station first detection data as to a constituent of said first stream, advancing a second stream of matter through said

detection station simultaneously with said first stream, emitting detection medium to be active at a transverse section of said second stream at said detection station, wherein the latter medium is varied by variations in the composition of matter of said second stream at the latter transverse section, and obtaining from said detection station second detection data as to a constituent of said second stream, and wherein the varied medium from both of the first and second streams is received by a receiving device common to both streams.

Sub B12 C1 a 148. A method according to claim ~~147~~ 172, wherein each of the first and second streams comprises objects distributed across the stream.

Sub E1 a 149. A method according to claim ~~147~~ 172 or 148, wherein the first and second streams are advanced in a common direction through said detection station.

a 150. A method according to claim ~~147~~ 172 or 148, wherein the first and second streams are advanced in respective opposite directions through said detection station.

Sub B13 151. A method according to claim 147, and further comprising utilising the first and second detection data to separate from the respective first and second streams respective first and second fractions comprised of said constituent of said first stream and said constituent of said second stream, respectively.

152. A method according to claim 151, wherein the first fraction constitutes the second stream.

Sub B14 153. A method according to claim 147, wherein said constituent of said first stream is of substantially the same composition as said constituent of said second stream.

154. A method according to claim 147, wherein said constituent of said first stream is of a significantly different composition from said constituent of said second stream.

~~155. Apparatus for automatically inspecting matter for~~ varying composition, comprising a detection station, first advancing means serving to advance through said station a first stream of matter, first emitting means serving to emit detection medium to be active at a transverse section of said

stream at said detection station, a receiving device serving to receive detection medium varied by variations in the composition of said matter at said section, detecting means serving to produce first detection data as to a constituent of said first stream at said station, second advancing means serving to advance a second stream of matter through said station simultaneously with said first stream, and second emitting means serving to emit detection medium to be active at a transverse section of said second stream at said detection station, said receiving device serving also to receive detection medium varied by variations in the composition of the matter at the latter section and thus being common to both of the first and second advancing means, and said detecting means serving to produce second detection data as to a constituent of said second stream.

Sub E2 a

156. Apparatus according to claim ~~155~~ 175, wherein the first and second advancing means take the form of a single conveyor.

157. Apparatus according to claim 156, wherein said single conveyor includes a single conveying belt.

158. Apparatus according to claim 156, wherein said single conveyor has a partition extending therealong to keep the streams apart from each other.

Sub E3 a

159. Apparatus according to claim ~~155~~ 175, and further comprising returning means serving to transport to said second advancing means upstream of said station to constitute said second stream a separated-out fraction of said first stream comprised of said constituent of said first stream.

Sub ~~B15~~ d1

~~160.~~ ~~Apparatus~~ according to claim 155, wherein the first and second emitting means are ~~so arranged~~ as to extend across both of the first and second streams.

161. Apparatus according to claim 160, wherein the first and second emitting means comprise a row of radiation sources.

Sub ~~B16~~ d2

~~162.~~ ~~Apparatus~~ according to claim 155, wherein said receiving device is so ~~arranged~~ ~~as~~ ~~to~~ extend across both of the first and second streams.

163. Apparatus according to claim 162, wherein said receiving device comprises a radiation-reflecting device.

164. Apparatus according to claim 163, wherein said reflecting device comprises a mirror which is substantially arcuate concavely in a plane parallel to a widthwise plane of the first and second streams and which is obliquely inclined to the former plane.

165. Apparatus according to claim 164, wherein said mirror is part of an imaginary, substantially toroidal surface.

Sub B17 D3

166. Apparatus according to claim 155, wherein said receiving device comprises a multiplicity of metal-sensing means arranged so as to be discretely distributed across the first and second streams and serving to detect metal portions constituting the constituent(s) of at least one of the first and second streams.

~~167. Apparatus for automatically inspecting matter~~ for varying composition, comprising advancing means for advancing a stream of said matter, a detection station through which said advancing means advances said stream, emitting means serving to emit a detection medium to be active at a transverse section of said stream at said station, receiving means at said station arranged to extend physically across substantially the width of said stream serving to receive detection medium varied by variations in the composition of said matter at said section, detecting means serving to generate detection data in dependence upon the variations in said medium, and data-obtaining means connected to said detecting means and serving to obtain said detection data therefrom, wherein said station is a metal-detection station, said emitting means serves to emit an electromagnetic field, and said receiving means comprises a multiplicity of electromagnetic field sensing devices arranged to be distributed across said stream.

Sub E4

168. Apparatus according to claim 167, wherein said emitting means which serves to generate an electromagnetic field comprises an antenna extending across said advancing means at said metal-detection station.

169. Apparatus according to claim 167 or 168, wherein said advancing means is situated between said emitting means and said receiving means for the field.

170. Apparatus according to claim 167, wherein said emitting means is connected to an oscillator, whereby said electromagnetic field oscillates, and wherein said sensing devices are electromagnetic field frequency sensing devices.

171. Apparatus according to claim 167, wherein said data-obtaining means serves to construct from the detection data from said electromagnetic field sensing devices a two-dimensional simulation of said matter passing through said detection station.

Add A1

~~Add B2~~